



VANESSA ROSE GRAHAM

Ulverston Victoria High School



promoting physics

## OGDEN TRUST TEACH PHYSICS REFLECTIVE DIARY 2018

As my university course at University of Leeds came to an end, I opened myself to a new opportunity and applied for the 5-week internship at Ulverston Victoria High School (UVHS) through the Ogden Trust. I have a strong interest in teaching and outreach, since partaking as an outreach ambassador for the Physics department at Leeds University and conducting a short internship at Allerton High School (Leeds). Through these experiences I found that I thoroughly enjoyed working with and alongside young people and teachers and was thrilled to get others excited about physics and STEM. The internship with UVHS particularly appealed to me as it was not far from home and meant that I would be in a familiar area, giving back to my local community. The school has an excellent pass rate especially at A-Level, with 100% pass-rate across all 22 subjects in 2017 and almost half their A-Level students achieving at least one grade A [1].

UVHS students are enthused and excited to learn, unfortunately, this meant I did not observe lessons which were disrupted by behavioural issues, thus will not have experienced the broad scope of what teaching can entail.

### **My First Day...**

After being warmly welcomed during the induction (27<sup>th</sup> April 2018), I was excited to begin my internship with UVHS. To begin my first day (Thursday 14<sup>th</sup> June 2018), I attended a Safeguarding induction with the Safeguarding leader of the school – this ensured I had the relevant training and understanding to keep the students and myself safe during my time at UVHS and broadened my view on the roles as a teacher. Following this, I attended a Health and Safety induction – this gave me instructions on what to do in different circumstances such as a fire or coming across an unidentified adult in the grounds. The school had multiple information points with regarding to First aid and other policies and recommendations provided by the council. My main point of contact was the Head of Physics of UVHS, Mr Alaric Thompson.

### **Timetable**

Mr Thompson and I constructed a timetable suitable for my internship, including Physics, Computing and Art lessons for students ranging from year 7 to year 12, with a range of abilities. I was also given a year 8 form to be present with during morning and afternoon registration with Mr Gannon to get an idea of how teachers not only have a role in direct subject teaching but also to pass on important morals to integrate the students into society.

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[1] Ulverston Victoria High School. (2018). *Exam Performance*. [online] Available at: <https://www.uvhs.uk/page/?title=Exam+Performance&pid=22> [Accessed 22 Jun. 2018].

|               | Monday                    | Tuesday               | Wednesday             | Thursday                | Friday                                |
|---------------|---------------------------|-----------------------|-----------------------|-------------------------|---------------------------------------|
| Before school | Staff Briefing            |                       | Year Team Meeting     | Staff Briefing          |                                       |
| Registration  | Year 8 Form: P Ga         |                       |                       |                         |                                       |
| Period 1      | Year 12 #1:<br>A Th (A22) |                       |                       |                         | Year 10:<br>K Gdr (A23)               |
| Period 2      |                           |                       |                       |                         | Meet with A<br>Th: Week<br>Reflection |
| Break         |                           |                       |                       |                         |                                       |
| Period 3      | Year 7.6:<br>J Ho (A25)   | Year 9:<br>J Sd (A21) | Year 9:<br>J Sd (A21) | Year 10:<br>K Gdr (A23) |                                       |
| Period 4      |                           |                       |                       |                         |                                       |
| Lunch         |                           |                       |                       |                         |                                       |
| Registration  | Year 8 Form: P Ga         |                       |                       |                         |                                       |
| Period 5      | Year 12 #2:<br>A Th (A22) |                       | Year 12:<br>ART       | Year 8:<br>A Th (A22)   | Year 12:<br>J Ev<br>Computing         |
| Period 6      |                           | Year 10: ART          |                       |                         |                                       |

During the periods 3-4, I was present in a year 10 class and learned about the importance of student-teacher (K Gdr - see timetable) interaction and the struggle to keep students enthused and answer questions. The class constituted mostly of girls who did not seem to enjoy getting involved and answering questions. On the other hand, the male students were usually the first to answer. During period 5-6, I supported Mr Thompson's (A Th, see timetable) year 8 class where they were experimentally investigating the effect of light intensity (or voltage of the solar cell) with distance. Although the task was to achieve an (voltage-distance) inverse square graph, Mr Thompson wanted the students to understand what are dependent, independent and control variables. The students were engaged during the experiment but did require a lot of help during the experiment to ensure a fair, reliable test.

### Friday 15<sup>th</sup> June

#### Year 10

I accompanied the year 10 physics lesson again where they were looking at current-voltage characteristic curves for different circuit components. This was for their required practical which have replaced ISAs and EMPAs (pre-reform). This gave me an opportunity to observe and get to know the class more and to notice different ways the teacher (K Gdr) encouraged the girls (majority of the class) to engage (being rather softly spoken) and to discourage bad behaviour i.e. forgetting equipment, in which the teacher awards the student behaviour points

I also noticed how the teacher often used shushing and saying 'Ladies and Gentlemen' to get the classes attention when chatter became too loud when she was talking. This is down to the teacher's style; other methods are given below.

#### Year 12

During the afternoon, I organised to observe a year 12 computing class earlier that day, which gave me insight into how lessons work out of a conventional classroom (lesson was conducted in a small computer

cluster). Due to the students being older and computing being undersubscribed within the school, the class was small (8 students). This gave me the chance to help more students one-on-one, which meant stronger relationships could form which in future ensures stronger safeguarding.

## **Monday 18<sup>th</sup> June**

### *Staff Briefing*

Mr Gannon, whose form I have been attending, took me to attend the staff briefing where they discuss the behaviour of pupils in each year group and any students who may need extra care, such as those on report or are injured/have a disability. I think communication between teachers is extremely important and these meetings provide clear instructions and allow form tutors to pass on messages to their students from the senior team quickly and efficiently. A pep talk was given by the head of school after the end of each of these meetings.

### *Year 12 #1*

During the morning was a double period with year 12 Physics class (8 students). The students were beginning their first substantial investigation on the viscosity of glycerol: to plan, execute and write a report on the experiment. The students were given a task sheet in which briefly explained some background information on the drag forces and listed what they needed to include in their final report. Due to a German listening exam downstairs, Mr Thompson asked the students to go to the computer room and continue planning/researching for their experiment. This has shown how as a teacher you must think on your feet to accommodate the needs of others.

I accompanied the students while Mr Thompson set up their equipment. This gave me the opportunity to pass on my expertise of report writing and offer useful websites for Harvard Referencing. After the first hour, they returned to the lab and began to collect data. Mr Thompson chose to refrain from 'hand-holding' so the students would work independently and learn from their mistakes. This proves that teachers need to be as hands-off as they are hands-on for the benefit of independent learning.

When one of the students accidentally smashed a large class cylinder of glycerol, Mr Thompson remained calm and instructed the students to stay back from the area to prevent slips or any injuries. Mr Thompson then quickly grabbed a spill kit (bucket, mop, towels, dust pan and brush, etc., prepped for these situations).

### *Year 7*

The double lesson with the year 7 group was quite a contrast to the other classes I have attended. Not only due to the students being younger and generally less focused, but also Dr Holden has a very different style to Mr Thompson. The students were working in groups (of their choice) of 2/3 to make posters on space. The students were given a step by step task sheet in the form of a mind map, unlike the black and white bullet point list given to the year 12s; exhibiting that even the task sheets need to be tailored to the age and ability of the group. The lesson remained loud throughout, but a majority of the students remained on task. I wandered the room helping to refocus the students and help with tasks.

### *Year 12 #2*

In the afternoon, I attended a different larger year 12 physics class with the same task in hand (viscosity investigation). Similar to the other group, they had already begun planning the experiment and Mr Thompson quickly told them to begin independently. This group were given the opportunity to get straight into the experiment, and although they worked louder (often discussing the experiment), the group completed taking results. This gave me the opportunity to give advice on good experimental practise.

## **Tuesday 19<sup>th</sup> June**

### *Year 9*

I accompanied Miss Seed's 32 student year 9 physics lesson on convection following from their previous conduction and radiation (heat transfer) lessons. Miss Seed open the lesson with a short practical to show a convection loop. The students got into their own groups and collected the equipment to heat water while a dye dissolved. Miss Seed then asked them what they noticed and asked them to explain, particularly beyond 'heat rises'. Miss Seed conducted multiple demos to reiterate what happened when there are convection currents, repeating key words needed for exams: density, kinetic energy, thermal energy etc. Miss Seed concluded the lesson using an analogy of each heat transfer which the students could relate to and asked which related to each transfer. They began a short task how you can insulate each of the heat transfers best relating it to housing insulation, again applying the theory to real life.

### *Year 10 Art*

The art teacher did not introduce the single lesson as the students understood from the previous lesson of their aims and continued to produce their wire or clay sculptures. The group of 12 students are able and needed little help so I took the opportunity to get to know them and ensure they stayed on track during the lesson.

## **Wednesday 20<sup>th</sup> June**

### *Year 9*

I accompanied Miss Seed's class again, which I believe is very important, so the students see a recurring face to establish stronger relationships. At the beginning of the class I noticed there was a student who was upset, so Miss Seed suggested they sit outside the classroom with a friend for a couple minutes. During the introduction to the lesson, Miss Seed asked the students what they had learnt from the previous lesson and coaxed answers from them when they were unsure which direction to go into. During which, I asked if the students outside the class were ok and ready to join the lesson again, and they were much calmer and ready to learn. I think this was important not only to give the student space but not to distract the other students. The lesson followed with a very productive practical and when students did get off track Miss Seed and I suggested next steps to realign their focus.

### *Year 12 Art*

Unlike within the year 12 physics classes, the art students don't often research in comparison to science students, consequently they were set to design top trump cards including information about artists and their artwork which they can play once and learn about the one another's artists. This gave the students the opportunity to design while simultaneously researching. This proved teaching involves tailoring the content to students and subjects.

### **After the first week...**

I was excited to get back. This week I reflected on the importance of supporting the students emotionally. I sat with a Y12 student, whom I had not met before, who had been struggling with their sister becoming ill, and therefore experienced some disturbed nights and stressful days at home and plenty of worry while at school. I made her a cup of tea and chatted to her to calm her down and get away from the stress of learning and worrying about home. This week has been quite upsetting for some of the students; a holocaust survivor came into assembly. The students were very interested but also found it quite distressing. Teachers have an important role of care; students are under an especially large amount of stress, particularly during exam time.

The Y11 students had an induction day with the task to show a taster of what A-Level Physics is like. A lot of the students struggle to decide what A-Level and GCSE subjects to take as this may affect what will happen in their future. It is particularly difficult from a teacher's point of view as you want the student to make the correct decision for them but obviously you would also like many students taking up your speciality. It is also quite difficult as the school gets more funding if more students take up subjects like Further Maths which creates a conflict of interest for the student's future.

This week I also conducted an apprenticeships session during form, where I encouraged the students to discuss whether they would like to do an apprenticeship and what they are all about. I also played a video providing information on them and afterwards needed the form tutors help to encourage discussion. They suggested I pick out students to answer questions if no one responds and wander around to encourage everyone gets involved. I have become more confident talking to a class and have really settled in, especially within my form.

This week has been an eye-opening week of how it is necessary for a teacher to be very flexible. Since my planned 'Physics careers' lesson, where I had technical issues, I have further realised the strong ability of teachers to spontaneously think and plan. During a double year 9 lesson, Miss Seed noticed the students were very willing to partake in discussion after showing them a video about renewable and non-renewable energies. Miss Seed decided to use that and get them to organise a debate in teams, one team for nuclear energy and the other against. This worked incredibly well, and each team had five minutes to say their practised speech and get the class to vote if they are for or against nuclear energy. Often the class got very loud but were mostly talking about energy. This really showed how passionate they could be about science, which was very exciting. Along with many varieties of lessons I have witnessed, it reveals that lessons do not always have to be a lecture and often students are curious of information. In preparation for my lesson, I have found planning is taking a lot longer than I expected, but this would get easier with more experience. I have taken ideas from observations, by using videos during my lesson to make sure the students have the concept of specific heat capacity explained in as many ways as possible.

Most of the year groups have been doing end of year tests and afterwards the teacher gives them a yellow sticker which they grade for effort, compare their test grade to their target grade and put an 'Even better if..' statement. Usually the teacher marks this for class work and the students are awarded points if they work above their target grade, which then goes on their yearly report. This award system seems to work very well, especially for the lower school and the risk of behaviour points deters bad behaviour.

As the year has begun to wind down, I have had more of an opportunity to get to know the students. All of the students are very friendly, some lack confidence but it has grown with time spent with them.

During my time at UVHS, Caroline, the physics technician took sick leave, consequently the teachers often were very rushed off their feet to collect equipment, which was not always in expect places. This shows the integral importance of technicians within the science department and school. There are many roles behind the scenes of a school, when removed the infrastructure breaks down, putting a strain on teachers, removing their focus from lessons.

Alongside many other teachers, we offered out sun cream and water during sports day, again proving the duty of care of a teacher and the preparation and ability to think ahead. After sports in the morning, the students had a short break and then back to timetabled lessons. I had a 40-minute year 7 lesson, where we had planned to conduct a water rockets lesson however, due to scheduling the lesson was shortened. This was a great opportunity for the students to do some reflection on their test and then complete their space posters.

### **Careers in Physics Workshop**

I conducted a Careers in Physics 50-minute lesson, the aims of the workshop were to get the students thinking about the skills, attributes and jobs in which physicists have. Underlying aims were to inform them about how to apply for jobs and why making it obvious what your skills are on your CV is important. I asked for some help from Erin McNeil (outreach officer at University of Leeds) and she sent me some resources including the PowerPoint which I tailored for year 10 and the score calculator (a website) which is constructed from the multiple files. Unfortunately, not all the files could be transferred onto the laptop which connects to the projector causing the website not to function completely and therefore reducing the planned flow of the lesson, with less time focussed on completing the aims. Mr Thompson solved the problem by pointing a camera at my laptop and connect it to the projector and the students could see the points being awarded. This enlightened me that teachers are excellent multitaskers and often have to juggle fixing technical issues and guiding the students' behaviour. Teaching requires a lot of organisation and planning for the worst. I thoroughly enjoyed conducting the lesson and felt more comfortable in myself talking in front of a class of students while being observed. The school has chosen to use my workshop in the Year 9 curriculum for the upcoming year.



Careers in Physics workshop with my year 10 physics class. Informing the students of the broad range of jobs physicists can do using a 'top trump' competition to select the best candidate for each role.



I had many opportunities to observe and take part in other activities put on by the school including the 8-mile sponsored walk and the Year 7 John Muir award week. I also got a chance to see how much organisation goes into these activities.

### **Reflection**

These past five weeks have been thoroughly enjoyed and have given me an insight into the roles and responsibilities of a teacher as well as improving my communication skills (especially in front of large groups) and my confidence to conduct a lesson independently. Although many observations could not fit into this report, during my time at UVHS I did less than half the required work than a full-time member of staff, excluding admin, report writing and marking – all of which teachers often are exhausted by. In summary, teaching is a very hard-working job, often breaks and lunches are worked through to ensure everything is organised, and very often there are never enough hands to help. This experience has exhibited to me that teachers do not get enough credit, with many capacities and tasks behind the scenes, other than solely teaching.

This internship has been eye-opening for me and proved teaching is a very tiring and exciting job. While this is true, I believe at this point in time teaching isn't right for me but I would definitely consider the career in the future.